Texas Water Development Board

City of Gorman

DWSRF GREEN PROJECT RESERVE BUSINESS CASE EVALUATION

STATE FISCAL YEAR 2015 INTENDED USE PLAN

PROJECT NUMBER 62660

COMMITMENT DATE: January 29, 2015

DATE OF LOAN CLOSING: May 21, 2015

GREEN ESTIMATE AT CLOSING: $272,879

TEXAS WATER DEVELOPMENT BOARD

Green Project Reserve

Green Project Information Worksheets

Drinking Water State Revolving Fund

Intended Use Plan

The Federal Appropriation Law for the current fiscal year Clean Water and Drinking Water State Revolving Fund programs contains the Green Project Reserve (GPR) requirement. The following Green Project Information Worksheets have been developed to assist TWDB Staff in verifying eligibility of potential GPR projects.

TWDB-0163
Revised 12/2/2010

TEXAS WATER DEVELOPMENT BOARD
DRINKING WATER STATE REVOLVING FUND (DWSRF)
GREEN PROJECT INFORMATION WORKSHEETS

PART I – GREEN PROJECT INFORMATION SUMMARY

Check all that apply and complete applicable worksheets:

Categorically Eligible

- ☐ Green Infrastructure $ _____
- ☒ Water Efficiency $ $65,000
- ☐ Energy Efficiency $ _____
- ☐ Environmentally Innovative $ _____

Business Case Eligible

- ☐ Green Infrastructure $ _____
- ☒ Water Efficiency $ 210,000
- ☐ Energy Efficiency $ _____
- ☐ Environmentally Innovative $ _____

Total Requested Green Amount $275,000

Total Requested Funding Amount $275,000

Type of Funding Requested:

- ☒ PAD (Planning, Acquisition, Design)
- ☐ C (Construction)

Completed by:

Name: Cory Higgins Title: EIT

Signature: Cory Higgins Date: 8/29/14

PART II - CATEGORICALLY ELIGIBLE

Complete this worksheet for projects being considered for the Green Project Reserve (GPR) as categorically eligible. Categorically eligible projects or project components are described in the following sections of the EPA GPR guidance (TWDB-0161):

Green Infrastructure	Part B, Section 1.2
Water Efficiency	Part B, Section 2.2
Energy Efficiency	Part B, Section 3.2
Environmentally Innovative	Part B, Section 4.2

Information provided on this worksheet should be of sufficient detail and should clearly demonstrate that the proposed improvements are consistent with EPA and TWDB GPR guidance for categorically eligible projects. Refer to **Information on Completing Worksheets** for additional information.

Section 1 – General Project Information

Applicant: City of Gorman PIF #: _____

Project Name: Water System Improvements

Contact Name: Ken Martin

Contact Phone and e-mail: 325-695-1070 kbm@jacobmartin.com

Total Project Cost: $275,000 Green Amount: $65,000
(Categorically Eligible)

The Business Case eligible portion of this project is to reduce its water loss by eliminating the old cast iron water lines (80 years old) which are the main source of water loss due to leaks. Also, the water quality provided by these old unlined cast iron mains is unacceptable due to the amount of cast iron residue and sediment in the pipe. The city has received numerous complaints from customers about poor water quality due to unlined cast iron piping. Finally the elimination of the old cast iron lines will allow the city to maintain a more acceptable disinfection residual since the large chlorine demand, created by the iron bacteria, will be eliminated. The currently proposed project will consist of replacing approximately 25,000 linear feet of cast iron water lines with 6" and 8" PVC water lines.

The Categorically Eligible portion of the project is to replace all existing water meters with an automatic meter reading system.

Section 3 – Water Efficiency

Certain water efficiency improvements may be considered categorically eligible for the GPR. Refer to EPA and TWDB GPR guidance for a complete list and description of categorically eligible GPR Projects. A few common types of water efficiency projects that may be considered categorically eligible, such as certain water meter improvements and leak detection are listed below. Complete these sections of the worksheet as applicable. For any other water efficiency improvement being considered for categorical eligibility, complete Section 3.3.

Section 3.1 - Water Meters

Check all that apply:

- ☐ Installation of new water meters in area currently receiving unmetered water service (the following must be provided)
  - ☐ Attach copy of rate structure for area to be metered
- ☒ Replacement of existing broken/malfunctioning meters (the following must be provided)
  - ☐ Accuracy of meters being replaced _____
  - ☐ Attach supporting documentation (meter accuracy tests, etc)
  - ☒ Provide description below of proposed meters to be installed
- ☐ Retrofitting of existing meters (the following must be provided)
  - ☐ Provide description below of reason for meter retrofit
  - ☐ Provide description below of proposed meter system and benefits, including description of features that will result in water loss reduction or promote water conservation

The City of Gorman is proposing to replace all existing meters with an automatic meter reading system. The inaccuracy and leakage of the existing meters is causing significant water losses in the system. The proposed system will improve accuracy and reduce leaks.

The proposed system will include tamper prevention leak alarm and data logging among others. The system will also include a drive by data collection system to maximize meter reading efficiency. These features will improve operator's awareness of their system and greatly improve overall efficiency.

Green amount associated with water meters: $65,000
(Attach detailed cost estimate if necessary)

PART III - BUSINESS CASE ELIGIBLE

Complete this worksheet for projects being considered for the Green Project Reserve (GPR) as business case eligible. Business case eligible projects or project components are described in the following sections of the EPA GPR guidance (TWDB-0161):

Green Infrastructure	Part B, Section 1.4
Water Efficiency	Part B, Section 2.4 and 2.5
Energy Efficiency	Part B, Section 3.4 and 3.5
Environmentally Innovative	Part B, Section 4.4 and 4.5

Information provided on this worksheet should be of sufficient detail and should clearly demonstrate that the proposed improvements are consistent with EPA and TWDB GPR guidance for business case eligible projects. Refer to **Information on Completing Worksheets** for additional information.

Section 1 – General Project Information

Applicant: City of Gorman PIF #: _____

Project Name: Water System Improvements

Contact Name: Ken Martin

Contact Phone and e-mail: 325-695-1070 KBM@jacobmartin.com

Total Project Cost: $275,000.00 Green Amount: $210,000.00
(Business Case Eligible)

Brief Overall Project Description:
The Business Case eligible portion of this project is to reduce its water loss by eliminating the old cast iron water lines (80 years old) which are the main source of water loss due to leaks. Also, the water quality provided by these old unlined cast iron mains is unacceptable due to the amount of cast iron residue and sediment in the pipe. The city has received numerous complaints from customers about poor water quality due to unlined cast iron piping. Finally the elimination of the old cast iron lines will allow the city to maintain a more acceptable disinfection residual since the large chlorine demand, created by the iron bacteria, will be eliminated. The currently proposed project will consist of replacing approximately 25,000 linear feet of cast iron water lines with 6" and 8" PVC water lines.

The Categorically Eligible portion of the project is to replace all existing water meters with an automatic meter reading system.

Section 3 – Water Efficiency

Certain water efficiency improvements may be considered business case eligible for the GPR. Refer to EPA and TWDB GPR guidance for a complete list and description of business case eligible GPR Projects. For all water efficiency business case eligible projects Section 3.1 must be completed. A common water efficiency project that may be considered business case eligible is water line replacements to address water loss. For this type of project complete Section 3.2 of the worksheet. For any other water efficiency improvement being considered for business case eligibility, complete Section 3.3.

Section 3.1 - System and Water Loss Information

Section 3.1 is required for all water efficiency business case eligible projects. Attach a copy of most recent Water Audit, if available. Otherwise, complete and attach Water Audit Worksheet or provide water audit data in a similar format. Additional information on water loss and water audits as well as a copy of the Water Audit Worksheet is available at:
http://www.twdb.state.tx.us/assistance/conservation/Municipal/Water_Audit/wald.asp

Reference and attach water loss audit and/or any other completed planning or engineering studies:

- ☒ 2009-2014 Usage and Loss report
- ☒ 2013 Water Loss Audit
- ☐ Click here to enter text.

Section 3.2 - Water Line Replacement

Proposed pipe to be replaced:

Length (LF)	Existing Pipe			Proposed Pipe	
	Material	Age (yr)	Dia. (in)	Dia. (in)	Material
15,000	Cast Iron	50+	6	6	PVC- C900
10,000	Cast Iron	50+	8	8	PVC- C900

Percent of distribution lines being replaced: 35%

Number of breaks/leaks/repairs recorded in past 24 months for areas being replaced: _____

Estimated water loss from pipe being replaced (provide calculations on following page): 3.78 MGY

Estimated annual water savings (provide calculations on following page): 3.4 MGY

Estimated annual cost savings (provide calculations on following page): $15,726

Provide detailed description of the propose improvements and provide supporting calculations. Description should include a description of the methodology used to select pipes for replacement (attach additional pages if necessary):
The City of Gorman provided the attached monthly water usage and loss reports for 2009 to the present. The report shows several months with "water sold" amounts greater than "water pumped", resulting in a reported negative water loss and indicating there are consistent errors in the report. It is unknown if the source of the error is due to meter accuracy or meter reporting issues. The City is taking steps to identify and resolve the issue. The 2013 reported monthly water loss varies from -22% to 18% with an average of 5%.

Since the attached loss report and audit are most likely inaccurate, estimations were made to assess the water loss. City staff estimates there are approximately 35 breaks/year in the 4.7miles of 6" and 8" lines being replaced. Assuming each leak is an average of 25gpm with 3 day leak time, a conservative estimate can be made that the City loses 108,000 gal per leak. Therefore, total estimated water loss due to pipes being replaced is 3.78MGY, or 12% of total usage.

The following cost savings calculations are based on these estimates:

Estimated annual water loss in pipes being replaced		3,780,000 gal
Loss Reduction	x	90 %
Total Water Savings	=	3,402,000 gal
Water Production Cost per 1000 gal	x	$3.96
Water Production Savings	=	$13,472
Chemical & Testing Savings	+	$1,000 (estimated)
Labor & Equipment Savings	+	$1,000 (estimated)
Pumping Costs Savings	+	$ 254 (1)
Total Annual Savings	=	$15,726

(1) Water pumping costs is estimated as: $C = (0.746\ V\ h\ c\ /\ (3960\ \mu p\ \mu m)\ /\ 60$

where:

C = Pumping Cost
V = volume pumped (gal)
h = head (ft) (150ft assumed)
c = cost rate per kWh ($0.1 assumed)
µp = pump efficiency (0.7 assumed)
µm= motor efficiency (0.9 assumed)

Green amount associated with water line replacement: $210,000
(Attach detailed cost estimate if necessary)

USAGE AND LOSS REPORT

City of Gorman

Month	Water Pumped	Water Sold	Water Loss Prct	Average Use	Active Meters	Zero Use Meters	Over 50000	40001 50000	30001 40000	20001 30000	10001 20000	8001 10000	6001 8000	4001 6000	2001 4000	1 2000
01-09	2,789,800	2,763,900	-1.94	5,225	529	42	5	2	0	2	26	29	42	104	114	154
02-09	2,975,900	2,964,300	-1.29	5,572	532	44	8	0	0	2	23	30	52	99	115	154
03-09	3,011,200	2,469,200	16.01	4,712	524	38	7	0	1	1	19	16	50	85	135	167
04-09	3,584,600	2,854,700	18.27	5,448	524	35	6	1	1	5	32	29	46	91	120	152
05-09	2,973,200	2,625,600	3.28	4,973	528	30	3	4	3	2	35	28	44	77	126	160
06-09	3,495,500	3,407,800	-1.78	6,491	525	36	6	3	2	11	46	39	57	77	111	132
07-09	4,513,900	3,590,400	17.14	6,826	526	35	6	2	9	15	58	28	43	88	104	124
08-09	3,346,500	2,773,000	12.66	5,262	527	34	4	0	2	9	45	28	40	86	125	147
09-09	3,899,300	3,108,200	7.47	5,876	529	35	5	2	1	6	50	34	54	77	123	136
10-09	2,482,500	2,288,400	4.80	4,376	523	37	4	0	2	5	19	11	48	89	135	161
11-09	2,388,100	2,416,100	-4.31	4,646	520	40	4	2	0	4	18	14	48	95	138	155
12-09	3,202,400	2,448,400	21.20	4,664	525	40	4	1	1	5	20	21	46	95	121	165
01-10	3,000,700	2,677,400	2.44	5,179	517	41	4	0	2	5	23	20	56	99	116	149
02-10	2,703,600	2,149,100	16.81	4,141	519	44	4	1	2	1	12	14	42	87	128	174
03-10	2,488,400	2,505,400	-2.69	4,818	520	45	5	2	0	7	11	27	42	100	113	155
04-10	2,877,100	2,171,900	21.04	4,129	526	41	4	0	2	3	16	20	40	86	136	162
05-10	2,595,800	2,497,700	-2.00	4,748	526	43	5	0	1	4	28	32	47	90	102	155
06-10	4,249,500	3,304,000	18.72	6,269	527	44	3	4	6	7	59	33	58	86	91	122
07-10	3,040,700	2,851,800	3.75	5,463	522	47	6	0	1	8	47	28	50	83	107	137
08-10	3,760,400	3,186,700	8.61	6,093	523	42	8	2	3	10	53	26	54	74	88	153
09-10	3,532,700	3,025,300	8.70	5,730	528	43	5	1	1	7	47	32	53	86	102	138
10-10	2,578,100	2,482,900	-4.07	4,711	527	45	5	0	0	3	20	24	55	96	111	156
11-10	1,830,100	2,950,300	-69.41	5,641	523	42	5	0	1	5	29	31	45	100	104	148
12-10	3,430,700	1,924,500	39.53	3,701	520	48	4	1	0	1	11	15	29	76	142	181
06-11	0	3,586,100	0.00	6,831	525	38	6	2	9	15	51	35	41	75	117	126
03-11	9,165,000	2,442,600	-1.64	4,688	521	53	5	1	0	2	20	21	61	78	116	151
04-11	9,165,000	2,931,900	0.00	5,595	524	45	4	1	1	7	52	29	47	76	117	136
05-11	13,979,600	2,582,300	80.10	4,919	525	41	4	1	2	5	29	36	47	86	119	143
07-11	4,797,000	3,961,900	14.28	7,575	523	37	6	4	8	19	72	39	44	71	94	116
08-11	4,372,600	3,990,900	5.30	7,719	517	40	7	5	7	18	67	41	50	66	103	107
09-11	4,222,300	3,053,900	16.42	5,884	519	38	5	1	4	8	43	28	44	76	120	143
10-11	24,039,800	2,882,500	83.85	5,575	517	49	3	2	1	8	30	31	46	81	131	130
11-11	3,139,000	2,561,100	16.82	4,944	518	46	4	3	0	5	23	18	40	98	119	154
12-11	1,886,300	1,675,900	11.15	3,248	516	52	3	0	0	3	12	10	22	47	148	208

USAGE AND LOSS REPORT

City of Gorman

Month	Water Pumped	Water Sold	Water Loss Prct	Average Use	Active Meters	Zero Use Meters	Over 50000	40001 50000	30001 40000	20001 30000	10001 20000	8001 10000	6001 8000	4001 6000	2001 4000	1 2000
01-12	2,009,900	2,726,800	-43.13	5,305	514	45	3	0	3	5	30	24	66	85	108	130
02-12	2,633,300	1,870,000	27.09	3,659	511	42	4	1	0	5	10	9	23	84	135	177
03-12	2,158,000	1,817,700	13.45	3,599	505	46	3	1	1	0	11	9	26	67	147	186
04-12	2,450,800	2,681,500	-9.42	5,299	506	43	4	0	2	7	37	21	64	89	106	122
05-12	3,532,700	3,042,900	9.62	5,978	509	32	5	2	0	8	51	34	56	73	105	123
06-12	2,888,300	2,333,700	12.28	4,630	504	40	4	2	0	4	35	22	37	60	132	162
07-12	3,463,200	2,691,700	17.16	5,394	499	38	4	0	0	14	38	23	39	71	117	146
08-12	4,296,100	3,400,300	18.89	6,883	494	36	5	2	8	12	55	29	39	59	111	127
09-12	3,098,700	3,447,700	-16.92	6,993	493	31	6	1	2	9	57	38	58	71	106	104
10-12	3,023,700	2,123,700	26.76	4,334	490	35	4	1	0	4	20	15	36	89	120	158
11-12	2,145,600	1,996,000	4.18	4,065	491	37	2	2	1	4	18	18	30	70	141	162
12-12	2,196,700	2,280,300	-13.13	4,673	488	36	4	0	2	6	17	21	37	88	127	150
01-13	3,047,800	2,479,500	13.79	5,123	484	41	4	0	4	3	24	25	47	91	114	126
02-13	2,214,700	1,793,300	16.42	3,713	483	42	4	0	1	0	16	10	25	81	137	157
03-13	2,070,400	1,911,500	5.05	3,933	486	45	4	0	0	1	17	18	33	79	126	157
04-13	2,119,400	2,516,000	-22.02	5,114	492	44	3	1	2	4	32	29	59	87	98	129
05-13	3,164,200	2,518,500	14.40	5,088	495	45	5	0	1	3	36	20	46	75	116	141
06-13	3,041,600	2,739,600	5.95	5,523	496	40	5	0	1	11	45	18	48	70	99	156
07-13	3,821,800	3,039,100	17.60	6,115	497	37	6	0	1	18	44	26	49	55	110	141
08-13	3,189,900	3,146,900	-1.63	6,319	498	45	6	0	2	10	52	45	41	67	97	128
09-13	2,649,700	2,986,000	-16.47	6,020	496	39	5	2	4	3	58	29	45	75	100	130
10-13	2,549,200	2,112,100	15.97	4,293	492	49	4	0	1	4	16	20	39	69	124	157
11-13	1,874,100	2,209,500	-18.96	4,518	489	44	3	2	1	1	21	20	37	81	121	154
12-13	2,448,300	2,349,400	-0.04	4,854	484	41	4	0	2	3	21	11	40	73	124	155
01-14	2,823,200	2,017,500	24.75	4,212	479	39	3	0	2	0	22	15	34	64	129	156
02-14	1,998,900	2,268,300	-17.23	4,667	486	34	3	1	0	3	28	17	46	75	119	139
03-14	2,059,200	2,253,500	-13.08	4,666	483	34	3	1	1	4	20	19	43	79	103	163
04-14	2,608,100	2,105,000	16.41	4,358	483	38	3	1	1	2	20	16	43	75	118	156
05-14	2,565,900	2,693,300	-12.76	5,508	489	36	5	1	2	9	38	31	38	85	93	138
06-14	2,702,600	2,605,700	0.81	5,351	487	34	5	1	1	3	30	27	57	64	104	146
07-14	3,609,700	2,782,600	20.14	5,435	512	37	5	1	2	8	43	32	41	71	115	141
08-14	0	0	0.00	0	514	0	0	0	0	0	0	0	0	0	0	0

66 Month Totals **Monthly Averages**

USAGE AND LOSS REPORT

City of Gorman

Month	Water Pumped	Water Sold	Water Loss Prct	Average Use	Active Meters	Zero Use Meters	Over 50000	40001 50000	30001 40000	20001 30000	10001 20000	8001 10000	6001 8000	4001 6000	2001 4000	1 2000

Total Water Pumped	233,973,000	**Average Water Pumped**	3,545,045
Total Water Sold	172,045,700	**Average Water Sold**	2,606,753
Total Used for Fire/Flush	9,910,651	**Average Used for Fire/Flush**	150,161
Total Water Loss	52,016,649	**Average Water Loss**	788,131
Total Water Loss Percent	22.23 %	**Average Water Loss Percent**	22.23 %
		Average Customer Use	5,111

Qualified By: System Totals 01-09 to 08-14

TEXAS WATER DEVELOPMENT BOARD

P.O. BOX 13231, CAPITOL STATION

AUSTIN, TX 78711-3231

2013 Water Audit Report

A. Water Utility General Information

1. Water Utility Name: City of Gorman

2. Contact:

   2a. Name: Cory Higgins

   2b. Telephone #: 325-695-1070

   2c. Email Address: chiggins@jacobmartin.com

3. Reporting Period: From 1/1/2013 To 12/31/2013

4. Source Water Utilization, percentage: Surface Water 100.00 % Ground Water 0.00 %

5. Population Served:

		Assessment Scale
5a. Retail Population Served	1,083	
5b. Wholesale Population Served	60	
6. Utility's Length of Main Lines, miles	70,000.00	3
7. Number of Wholesale Connections Served	25	
8. Number of Retail Service Connections Served	498	
9. Service Connection Density (Number of retail service connections / miles of main lines)	0.01	
10. Average Yearly System Operating Pressure (psi)	50.00	1
11. Volume Units of Measure:	Gallons	

B. System Input Volume

12. Produced Water	0	gallons	0
13. Production Meter Accuracy (enter percentage)	0.00	%	0
14. Corrected Input Volume	0	gallons	
15. Water Imported	32,191,100	gallons	3
16. Water Exported	1,322,100	gallons	3
17. System Input Volume (Corrected input volume, plus imported water, minus exported water)	30,869,000	gallons	

C. Authorized Consumption

			Assessment Scale
18. Billed Metered	28,479,300	gallons	2
19. Billed Unmetered	0	gallons	0
20. Unbilled Metered	0	gallons	0
21. Unbilled Unmetered	385,863	gallons	0
22. Total Authorized Consumption	28,865,163	gallons	

2013 Water Audit Report

D. Water Losses

23. Water Losses (Line 17 minus Line 22)	2,003,838	gallons	

E. Apparent Losses

24. Average Customer Meter Accuracy (Enter percentage)	100.00	%	1
25. Customer Meter Accuracy Loss	0	gallons	
26. Systematic Data Handling Discrepancy	0	gallons	0
27. Unauthorized Consumption	77,173	gallons	0
28. Total Apparent Losses	77,173	gallons	

F. Real Losses

29. Reported Breaks and Leaks (Estimated volume of leaks & breaks repaired during the audit period)	0	gallons	1
30. Unreported Loss (Includes all unknown water loss)	1,926,665	gallons	1
31. Total Real Losses (Line 29, plus Line 30)	1,926,665	gallons	
32. Water Losses (Apparent + Real) (Line 28 plus Line 31) = Line 23	2,003,838	gallons	
33. Non-revenue Water (Water Losses + Unbilled Authorized Consumption) (Line 32, plus Line 20, plus Line 21)	2,389,700	gallons	

G. Technical Performance Indicator for Apparent Loss

34. Apparent Losses Normalized (Apparent Loss Volume / # of Retail Service Connections/365)	0	gallons

H. Technical Performance Indicators for Real Loss

35. Real Loss Volume (Line 31)	1,926,665	gallons
36. Unavoidable Annual Real Losses, volume (calculated)	6,912,638,275	gallons
37. Infrastructure Leakage Index (calculated) (Equals real loss volume divided by unavoidable annual real losses)	0.00030	
38. Real Losses Normalized (Real Loss Volume / # of Service Connections / 365) (This indicator applies if service connection density is greater than 32 / mile)	11	gallons

2013 Water Audit Report

39. Real Losses Normalized (Real Loss Volume/Miles of Main Lines/365) (This indicator applies if service connection density is less than 32/mile)	0	gallons	
I. Financial Performance Indicators			Assessment Scale
40. Total Apparent Losses (Line 28)	77,173	gallons	
41. Retail Price of Water	$0.00900		3
42. Cost of Apparent Losses (Apparent loss volume multiplied by retail cost of water, Line 40 x Line 41)	$694.55		
43. Total Real Losses (Line 31)	1,926,665.00		
44. Variable Production Cost of Water* (*Note: in case of water shortage, real losses might be valued at the retail price of water instead of the variable production cost.)	$0.00396		3
45. Cost of Real Losses (Real Loss multiplied by variable production cost of water, Line 43 x Line 44)	$7,629.59		
46. Total Assessment Scale			21
47. Total Cost Impact of Apparent and Real Losses	$8,324.14		
48. Comments			
49. Total Water Loss %	6.49	%	